

Options to Address Climate Change

(Some options can also address Resource Scarcity, Energy Affordability, Economic Growth, and National Security issues)

Executive Overview

Energy industry managements, news media, macroeconomists, and even environmental policy groups use mistaken beliefs to recommend actions to address climate change impacts. Our analysis shows all the energy markets are dysfunctional, with the problems different in each market. Globally customers overpay at least \$1.5 trillion for crude oil due to an ineffective market for transportation fuels... the incremental cost of the last 5% of oil demand exceeds \$35 per gallon. North American natural gas prices are about half the desirable price due to unrestricted shale gas development. Private green electric power projects get excessive investment subsidies, while publicly owned green power projects receive far less support. And proposed regulations encourage a switch from coal to natural gas, a very ill advised move.

There have been five options suggested to address climate change, instead of business as usual:

1. Carbon tax (carbon fee and dividend)
2. Subsidies and Loans
3. Cap and Trade
4. Rules and Mandates
5. Regulations

None of these options work well to address current energy market problems. None of these options achieve meaningful progress to address climate change in time. All of these options rely mostly on government agencies to plan and implement changes, and tries to do this without picking and choosing the best technologies.

6. Regulated Private Sector Coalition with Government Oversight

One option stands out as the best action plan to address climate change issues, as well as provide better economic growth and increased jobs, cause real declines in customer energy costs, and reduce national and global security risks. This option uses a regulated private sector Green Energy Coalition to invest to provide incentives to ramp green energy sources, improve effective use of energy, and increase carbon sinks. The Green Energy Coalition should get 50% of the reduction in customer costs for energy, in order to fund a growing annual investment budget. The best way to accomplish this, involves putting a tax on crude oil, tied to prices declining below the trend forecast.

Green Energy Coalition actions cause declining crude oil costs, particularly five to eight years out. Oil product customers will save more money than green vehicle buyers save, but all energy customers save money from the transition to green energy sources.

Forming a Green Energy Coalition would cause rapid capital formation and investment to address currently dysfunctional markets. Green energy suppliers, green technology developers, and energy conservation systems suppliers all benefit. The Coalition essentially creates a customer for new green tech products and services, and bridges the "Valley of Death" for green tech entrepreneurs.

- The Coalition puts in place an overall plan to address climate change impacts; this plan works well if coupled with appropriate regulatory action and government subsidies. Any of the other proposed solutions work better if coupled to Green Energy Coalition actions.
- Establishing the Coalition gives a skilled organization the responsibility and incentive to address all climate change impacts. The Coalition would have a large incentive to drive progress and profit from implementation and results.
- The Coalition would have a huge incentive to discover and understand all climate change impacts thoroughly, and tie solutions to improvements. The Coalition would be results-driven, linking reduced impact of climate change to solutions.
- The Green Energy Coalition would be responsible, and in turn is held accountable to customers, regulatory bodies, owners, and suppliers; and is subject to oversight by the governments raising the pass-through funds from a crude oil tax (tied to declining oil costs). Government can force the Coalition to address important concerns because the government controls the purse strings.

Recruiting major company investors is the first step in establishing a Green Energy Coalition. Building a large business group of supporters (from companies whose business units benefit from the changes in the energy markets), then leads to building the political coalition necessary to cause change in government actions and policies.

1. Energy Industry management mistakes

The energy industry management teams have failed to carry out their primary responsibilities to stakeholders (customers, suppliers, shareholders, community members). Customers have paid too much for energy (percentage of annual GDP) for over a decade now, even without considering significant costs (environmental, economic benefit, national security) not included in pricing. The key management personnel at the energy companies, particularly the oil industry management teams, failed to study the energy markets and identify the changes needed to provide customers with a set of products and services that meet a full suite of customer needs.

Global oil customers end up paying an incremental cost of over \$1500-\$2500 per barrel for the last 4-5 million barrels of daily demand, because the demand pushes up against production constraints driving oil prices higher. The energy cost of gasoline refined from this incremental oil ends up costing oil products customers over \$35 per gallon, at least 10X the cost of substitutes such as biofuels or EVs.

Natural gas prices in North America fall in a range of roughly half the desirable cost range due to unrestricted shale field development.

Green power projects receive investment subsidies and debt guarantees regardless of how they fit into an overall plan to shift to green power sources. Private sector green power projects get excessive government subsidies, while public or cooperative green power projects either get reduced subsidies or no subsidies.

Coal fired power plants are targeted as the “bad boys”, yet incentives, rules, and regulations push coal plant replacement with natural gas fired power plants with little improvement (in reduced environmental impact). Critics target the coal market as high priority, when the analysis in the attached review report, shows that the crude oil market should be targeted with the highest priority for change.

Energy industry managements have mostly ignored the changes needed, and have elected to play out their tenure without plans to provide customers with better energy choices.

Some energy company management teams instead embarked on plans to disrupt improved products using sabotaging actions and funded political efforts to stymie ramps in green energy sources and slow improvements in effective use of energy. These poorly performing management teams have accelerated their sabotaging actions this year.

2. Mistakes in news coverage and commentary by economists

News media reports and news sources also make mistakes in describing energy markets and covering options to address climate change. Recent articles, editorials and OpEds, often reveal errors and mistakes in understanding existing energy markets and green energy impacts on market pricing. The same mistakes repeat, reinforced not only by the opinions of the editors and news reporters, but also by many economists.

The biggest and most common mistakes:

- Assume that energy markets are efficient, and that market-pricing mechanisms offer the best (and sometimes only) way to introduce substitutions and drive Improvements in effective use of energy.
- Forecast that the existing ramp in green energy sources and energy efficiency improvements will accelerate to solve the critical problems in the timeframe required, without significant changes in government and private sector strategies. This “Trend is your Friend” mistake takes impetus away from identifying and seeking the critical system changes needed.
- Assume that innovative energy and environmental technology will be developed by the private sector and deployed in a capitalist free market system in the timeframe needed.
- Assume that political forces will need to overpower economic forces to push legislation and regulation that forces fossil fuel costs higher in all energy markets, leading to changes in customer choices. This assumption results in the belief that voter demands will drive political change; instead the business world must recognize that a full suite of customer needs should drive economic sectors (especially energy, transportation, water supply, and agriculture/forestry, with major impacts on housing, commercial buildings, heavy industry etc.), and the business world in turn will drive political change to benefit customers.

In reality, energy markets don’t address customer needs effectively, resulting in higher costs to customers and limited choices, while undervaluing important customer needs. Pinning our hopes on innovative technology to develop and deploy in time to have an impact under the current system is wishful thinking.

We should assign responsibility to a skilled organization to take action to fix and improve the dysfunctional markets. The skilled organization can exist in a government agency, but a better approach assigns this job to a private sector group, subject both to regulation and more importantly, oversight by government.

3. Failure of Environmental Policy NGOs

Surprisingly, many the energy and environmental policy institutes seem to not want the current problems solved, but instead ensure long careers in fighting for change that never comes. Most policy institutes don't have knowledgeable and skilled personnel who thoroughly understand energy markets. Instead they rely on academic sources that typically don't understand specific energy market operations. In most cases these academic sources only use broad economic principles, that unfortunately have little value and limited predictive capability, especially when used to compare alternative action plans to address deficiencies in individual energy markets.

NGOs use similar "free market" model assumptions to predict energy market response to those used by energy company management teams. Environmental policy NGOs simply extend the free competitive market model to add in all costs to society.

The key shortcomings of this approach:

- Free market models don't accurately forecast energy markets behavior.
- The models don't define and consider individual energy market factors.
- This market-driven belief promotes simple-minded macroeconomic solutions (e.g. carbon tax) that aren't suitable for most energy markets.
- This approach doesn't lead to a realistic effective plan to optimize societal costs.
- The models rely mostly on extrapolations and forecasts of market behavior that don't capture the full complexity of the changes caused by the costs added to various fossil fuel energy sources.
- The models don't examine and evaluate transition plans for each market sector, and thus miss many possible solution sets needed to optimize the transition. This will increase the cost of the transition.
- This approach doesn't put in place a system of monitoring and adjusting "on the fly" to market responses and customer needs.

In summary, environmental policy organizations are "boxed" into only certain choices of solutions by the "wrong" assumptions they made about energy markets.

4. Action Plan Options (to address climate change impacts and mitigate GHGs)

The only option that adequately addresses climate change impacts due to greenhouse gases isn't among the half dozen or so options that have been considered to date by government and policy experts. Examining the options logically, and understanding the limitations with the current markets, there is only one option will work well in the timeframe needed.

Paul Krugman lists some of the options in his recent NYTimes column "The Big Green Test", and I have re-arranged his list, inserting other options that have been promoted by environmental advocates. This list is approximately organized, first by the preferred priority by "economics experts", and then by the degree of government decision-making

and government agency expertise needed to make the proposed solution effective. I have placed the best option last on the list.

Zero Option: Rely on private sector competitors
(BAU with government only using the “bully pulpit”)

This option predominantly represents the current situation, and the status quo has its defenders, especially fossil fuel interests. Although currently some regulations, rules and mandates, and subsidy incentives are used to encourage green energy development and energy conservation, they are minor compared to the reliance on private sector competitors and blanket business investment subsidies.

This option hasn’t worked, and will not work. Relying mostly on the private sector to identify and invest to deploy technologies and commercial facilities to address climate change issues, when many of the impacts of climate change aren’t priced in the market, is unworkable. The investments involve substantial risks, and no clear path to recovering invested capital exists. Further, this option doesn’t consider a full suite of customer needs, not even customer demands on energy cost and price.

Option 1: Carbon Tax
(Most economists promote a carbon tax as the “Best option”).)

Government agency economists forecast market behavior and governments add a tax on carbon to reduce GHG emissions over time by increasing fossil fuel energy prices.

Investments in green energy substitutes and energy conservation are paid for by private sector, and eventually by customers, in terms of higher energy costs caused by the carbon tax. Most economists prefer higher energy prices to encourage energy substitution and conservation. Additionally the carbon tax proceeds could be used to reimburse citizens (Fee and Dividend), or address other fiscal issues, resulting in a neutral cost to people. However, cost of carbon taxes fall unevenly on people due to differences in regional use and demographic use. Thus the carbon tax, or carbon fee and dividend, proposals face political resistance.

Energy Market Impacts:

This option (carbon tax) primarily hits the coal industry raising the price of coal by 60% to 80% and would cause substitution of natural gas for coal, since natural gas prices only increase by about 20%. This isn’t a desirable outcome. Furthermore, much of the eventual substitution could be in the form of small Combined Heat and Power (CHP) units in commercial and residential buildings, fired by natural gas. We could end replacing 500 coal plant centralized emission sources with 100,000+ new CHP distributed emission sources.

The oil cost component of gasoline only increases by about 8 cents per gallon, and so a carbon tax doesn’t promote green vehicles or biofuels very well. And a carbon tax doesn’t directly address improving carbon sink capacities, and doesn’t increase funds to study and quantify climate change impacts.

- Does this option result in an overall plan in place to address climate change impacts? No.
- Does this option result in a 'steering' organization to drive progress and profit from implementation and results? No.
- Is this option results-driven, linking reduced impact of climate change to solutions? No.
- Who is responsible for this option working? Government. Adjustments and corrective actions must continually get Congressional approval and be signed by the President into law.

Option 2: Government Subsidies and Loans

(Intent: Stimulate private sector actions to address climate change.)

Government agency economists design subsidies, and various government bodies add investment subsidies and loans that lower the cost of green energy and energy conservation projects thus decreasing the cost of substitutes for fossil fuels.

This option uses government-funded subsidies and loans (essentially paid for by taxpayers) to encourage even greater expenditures of private sector capital. Most government subsidies would go to existing technologies. But even with the subsidies providing some incentives, private sector investment in developing technologies is very risky; this risk is compounded by the political risk that could cause subsidies to expire.

Subsidies and loans do lower the cost of green energy, and thus help prevent or slow rising energy prices. Some economists find this price response undesirable, preferring rising energy prices, and attack government subsidies.

Government agencies still need to predict market behavior, and set priorities based on the effectiveness of different technologies and practices to set subsidies.

Subsidies and loans can be tailored somewhat to individual energy sources and energy efficiency/conservation projects, but generally have been blanket plans that encompass many dissimilar alternative solutions and technologies that would benefit from individual analysis and selected financial support. Reaching an optimal set of solutions requires a "pick and choose" process.

Energy Market Impact:

With these subsidies, green energy supply has grown and energy conservation and efficiency have been rising, but at a rate much lower than needed to adequately address climate change. Nevertheless, without these incentives, green power, green vehicles, biofuels, and most energy efficiency/conservation projects wouldn't deploy. The incentives to develop technology supporting these substitutes would decrease, leading to a collapse of tech development efforts.

Addressing climate change impacts requires increasing incentives for these fossil fuel substitutes. A skilled organization must direct these efforts, and government agencies don't have the skills and capabilities to do this, and are handcuffed by restrictions that prevent them from carrying out this mission effectively.

- Does this option result in an overall plan in place to address climate change impacts? No.
- Does this option result in an organization with the responsibility to drive progress and profit from implementation and results? No.
- Is this option results-driven, linking actual reduced impact of climate change to solutions? No.
- Who is responsible for this option working? Government. Adjustments and corrective actions must continually get Congressional approval and be signed by the President into law.

Option 3: Cap and Trade

(Cap and Trade provides a “market” for pollution.)

Government agencies set up a market in the pollutant, restricting carbon or GHG emissions to a specified level.

Most proposals use the market to address stationary sources and large polluters, but don’t address emission sources from petroleum and natural gas heating use very well, nor does cap and trade adequately address carbon sink issues. Cap and Trade proposals only add a single concern, limit GHG emissions, to a customer needs analysis, and doesn’t address the full suite of customer needs.

Most proponents propose the cap and trade for use primarily in the electricity market. Proposals for cap and trade to cover use of natural gas in residential and commercial end markets, and cover use of oil products in the transportation sector haven’t been considered.

Cap and trade should drive energy prices higher in the market impacted, and encourages private sector free enterprise solutions, albeit in a partially regulated market.

Energy Market Impact:

Cap and trade schedules pollution limits in advance, and hopes that the market will identify the best and most cost-effective solutions, and then invest to develop and deploy these solutions. This outcome is highly unlikely. The rigged competitive market is no substitute for knowledge, and without a skilled organization evaluating alternatives, and funding the development of green tech, the outcome won’t satisfy the broad spectrum of customer needs.

- Does this option result in an overall plan in place to address climate change impacts? No.
- Does this option result in an organization to drive progress and profit from implementation and results? The government agencies propose the cap and trade restrictions to reduce GHGs, but only address some of the causes of climate change. No skilled organization has the responsibility to invest and improve energy and transportation systems to please customers.
- Is this option results-driven, linking reduced impact of climate change to solutions? No.

- Who is responsible for this option working? Government. Adjustments and corrective actions must get Congressional approval and be signed by the President into law.

Option 4: Rules and Mandates

(Economists generally do not prefer Government mandates.)

Governments at all levels can dictate energy options for their jurisdiction, and require use of green energy sources and energy conservation systems and methods. Some of the rules and mandates include states setting Recommended Portfolio Standards (RPS) for electricity suppliers, “net metering” rules requiring that electric utilities buy back power from small distributed power sources such as rooftop PV panels, and vehicle fuel efficiency rules for auto manufacturers.

In order for rules and mandates to work, government agencies must review progress, and suggest changes and modifications. In particular, rules and mandates should consider technology development, cost trends, market segment saturation levels, and changing environmental concerns, economic benefits, and national security issues. Currently the coordination of rules and mandates based on these factors involves primarily communication between agencies, without comprehensive planning. Changes in rules and mandates require approval by federal and state (and sometimes local) governments.

This option causes private sector investments to meet the rules and mandates, and pushes energy costs higher. Most economists prefer higher energy prices.

Energy Market Impact:

Rules and mandates place more restrictions without any increase in compensation, and thus sets up incentives to “game the system”. In the electric power market, RPS have increased green power, but much slower than needed. In the crude oil market, the fuel efficiency rules worked to decrease oil demand in the period 1979-1986 and resulted in collapsing oil prices, but failed to generate the investments needed in biofuel and green vehicle technology development. These rules aren’t driving substitution at the present time at the rate needed to impact global prices. Energy efficiency rules for appliances have helped moderate electricity demand, and reduce natural gas demand, but fall far short of what is required.

Rules and mandates would work much better if linked to other programs that increased compensation to suppliers for producing substitutes at the rate required to substantially decrease demand for fossil fuels.

- Does this option result in an overall plan in place to address climate change impacts? No, but it could be part of an overall plan.
- Does this option result in an organization to drive progress and profit from implementation and results? No.
- Is this option results-driven, linking reduced impact of climate change to solutions? No.

- Who is responsible for this option working? Government. Adjustments and corrective actions must get Congressional approval and be signed by President into law.

Option 5: Regulatory Controls

(Most economists do not prefer more government regulation.)

Establish some kind of government regulatory controls on greenhouse gas emissions, and many economists decry more regulation of markets and suppliers. Government regulatory agencies must have very good understanding and knowledge about energy markets, environmental concerns, and alternative new technologies as well as the plans to introduce the green energy sources effectively. This is a very difficult (almost impossible) task for a government agency.

Because new technologies must be deployed at massive scale in a short timeframe, this makes the regulatory agencies task even harder. The plan to ramp green energy relies on the important capability to recognize which new technologies will be utilized in the future during the ramp, then began funding and developing technology followed by deployment within a tight schedule. This effort involves massive investments, and this can't be done by the private sector driven by only simple-minded regulations. The investors need to have the confidence that a prolonged and persistent deployment of investments would result in a reliable market sector developing for their products. With government regulations, the regulatory agency, and the investors as well, must predict where the market will move, well in advance. This is an almost impossible task, without risk-adjusted forecasts of technology development and climate impacts.

A better process funds promising nascent technologies, then begin deployment on a trial basis, and then select the best alternatives to receive further commercial scale funding.

Energy Market Impacts:

Increasing regulations initially drive up energy costs, but if intelligently designed, over time regulations should help substantially reduce energy total costs. The positive impacts will take some time to realize because this option doesn't really promote rapid capital formation and investment to address currently dysfunctional markets.

- Does this option result in an overall plan in place to address climate change impacts? Somewhat, but slowly. The plan developed by the regulatory agencies will not be as comprehensive as needed to rapidly address customer needs.
- Does this option result in an organization to drive progress and profit from implementation and results? No.
- Is this option results-driven, linking reduced impact of climate change to solutions? Somewhat, but with a very slow feedback loop.
- Who is responsible for this option working? Government. Congress will attempt to oversee and block regulations they disagree with.

Option 6: Regulated private sector coalition invests to reduce climate change impacts

(Most economists shun solutions not based on free competitive markets.)

Even though not on most economists' radar, this option offers the best solution.

This proposal uses a predominantly private sector coalition, possibly containing government or NGO members, to plan and invest to accelerate deployment of both green energy systems and facilities to mitigate greenhouse gas emissions, as part of an effort to address a full suite of customer needs.

This Green Energy Coalition invests their own capital to deploy or subsidize green energy alternatives, facilities and systems to improve energy effectiveness, and programs to increase capacities of carbon sinks.

Because the suite of customer needs addressed by the Coalition goes beyond simply energy pricing, the private sector group receives compensation to ensure an adequate return on investment on effective actions, and continue the investment program.

In order for this to work the Green Energy Coalition must be subject to government oversight and regulatory controls.

But the level of control is less by an order of magnitude, than the amount of control needed if a government agency attempts to do the same work as this private sector coalition. The work must be done by some skilled organization, and a regulated private sector coalition works much better than government agencies alone.

After analyzing energy market responses to Green Energy Coalition funded incentives to ramp green energy, a key driver became apparent: the group's investments save money for customers by causing lower overall energy prices and energy costs. This private sector group can fix currently dysfunctional energy markets. In particular, it turns out that the oil markets are highly dysfunctional costing customers worldwide over a trillion dollars annually. The price of crude oil is much higher than necessary to sustain production for the transition period to green vehicles and biofuels, resulting in a misallocation of cash flow to the oil sector of at least 250 billion dollars annually in the United States alone.

A tax on crude oil structured to capture 30% of the decline in oil prices from the trend forecast would be sufficient to provide a cash flow to green energy sources to substitute green vehicles for a substantial portion of vehicle annual sales. Alternatively, biofuel incentives can cause substitution for petroleum products and reduce oil demand. The Green Energy Coalition should target ramping substitute vehicles and biofuels to comprise at least 10 percent of the OECD vehicle fleet within eight years, reducing oil demand by over 5 million barrels daily.

The Coalition would invest to deploy green vehicles and substitute fuels in the transportation market; and fund more energy efficient and fuel effective vehicles; invest in transportation alternatives to reduce the fuels demand; or biofuels that reduce demand for petroleum derived jet fuel; and substitute other fuels and energy systems for

heating oil and other oil products. This results in declining oil prices, and the Coalition would eventually receive large cash flows from a tax tied to declining real oil prices.

The cash flow from a tax recapturing 30% oil customer cost savings will likely exceed that needed to achieve a good rate of return (over 25% ROI pre-tax) on Coalition investments in substitute biofuels and green vehicle incentives. Therefore a properly regulated Coalition would forfeit a portion of the tax on crude oil cost savings back to the government entity.

However, if the government entity wishes, the Coalition can operate to invest in other green energy sources and energy use practices, to create more rational and functional energy markets in electricity, natural gas, and coal. In particular, the Coalition could use a portion of the funds from the tax tied to declining oil prices, to pay for a 30% investment subsidy for green power projects and systems to improve effective use of energy.

If the oil tax recaptures 50% of oil customer cost savings, the funds received from the tax can fund essentially all the corrective actions needed to reduce carbon emissions 80%, and increase carbon sink capacities.

The funds are sufficient to seize opportunities to reduce natural gas demand, thereby saving and conserving natural gas for use as a stopgap fuel for power generation in the future.

The cash flow from the crude oil tax is also sufficient to cover the replacement of coal power plants by negotiating better terms with existing coal plant owners. The Coalition would have the capability to offer these owners an opportunity to participate and replace coal plants with green power projects. There's even an opportunity to sweeten the pot by providing coal power plant operators an opportunity to invest in the Green Energy Coalition, participating in the greening of all the energy markets. This attractive set of investment opportunities should convince coal plant operators to voluntarily shut their plants down to take advantage of the opportunities. If coupled with moderate new regulations on emissions, the coal plant owners should be persuaded to abandon their fossil fuel plants.

Finally there's enough cash flow from the tax on oil cost savings to pay for extensive and comprehensive climate change science and environmental impact analyses. Some of the cash flow should pay for global carbon capture and carbon sink enhancement efforts.

The Coalition would have an incentive to invest in these additional groups and energy markets, because they could claim a larger portion of the proceeds from a crude oil tax (tied to declining oil prices) in their requested compensation from the government regulatory body.

Some people publishing an overview of solutions to address climate change, suggest that investment of roughly 20 or 30 billion dollars per year is needed to make substantial changes. In reality, in United States alone, it's going to require about 150 to 200 billion dollars annually at a minimum. To get an accelerated greenhouse gas emissions mitigation program underway in America requires close to 300 billion annually. Globally, at least another 300 billion is needed annually. Asking that customers to pony up this

additional amount of funding support, while at the same time supporting high fossil fuel prices, is a mistake. Customers are not going to accept this easily.

Therefore politically, the approaches that some political leaders and economists are suggesting, and the bulk of the environmental policy NGOs suggest, won't work. That makes the use of a Green Energy Coalition (a private sector entity, regulated by government) a much more realistic and feasible approach. Customers clearly would benefit from Coalition actions and investments, and this should reduce the political opposition. Additionally, a very large coalition of business interests would support Coalition actions.

Addressing a full suite of customer needs, including environmental concerns, requires a business sector entity develop the action plans and strategies, and manage the implementation. No one else can do this effectively.

And no matter how you cut it, in the end we must have a team of business managers willing to "get down in the mud and go 'snout to snout' with entrenched energy sector managers", who currently ignore their responsibilities to stakeholders. Only a strong business coalition can take on the big money vested interests that currently block action to address climate change.

Energy Market Impacts:

Forming a Green Energy Coalition causes declining crude oil costs, particularly five to eight years out. The petroleum industry, particularly refiners, will undergo huge changes and reduced profitability and reduced cash flow.

Oil product customers will save more money than green vehicle buyers save, but all energy customers will save money from the transition to green energy sources.

The price increases due to slower shale gas development might increase natural gas costs initially, until declining natural gas demand due to substitution pushes costs lower.

Forming a Green Energy Coalition would cause rapid capital formation and investment to address currently dysfunctional markets. Green energy suppliers, green technology developers, and energy conservation systems suppliers all benefit. The Coalition essentially creates a customer for new green tech products and services, and bridges the "Valley of Death" for green tech entrepreneurs.

- Does this option result in an overall plan in place to address climate change impacts?

Yes, especially if coupled with appropriate regulatory action and government subsidies. Any of the other proposed solutions work much better if coupled to a Green Energy Coalition.

- Does this option result in an organization to drive progress and profit from implementation and results?

Yes, a professional skilled organization with the responsibility and incentives to address all climate change impacts would exist.

- Is this option results-driven, linking reduced impact of climate change to solutions?

Yes. The Green Energy Coalition would have a huge incentive to discover and understand all climate change impacts thoroughly, and tie solutions to improvements.

- Who is responsible for this option working?

The predominantly private sector Green Energy Coalition, who in turn is held accountable to customers, regulatory bodies, owners, and suppliers; and is subject to oversight by the governments raising the pass-through funds from a crude oil tax (tied to declining oil costs). Government can force the Coalition to address important concerns because the government controls the purse strings.

5. Action Plan to establish a Green Energy Coalition

Political resistance and sabotaging actions:

The plan to establish a Green Energy Coalition should identify and include countermeasures (actions) to address key limiting conditions, blocks that must be hurdled during implementation, and sabotaging actions that opponents would use to stall progress.

Management experts, investment managers, and engineers who have seen the GEC proposal quickly identified several critical roadblocks and sabotaging actions. The use of government funding to compensate the GEC raises the biggest concerns.

Critical Limiting Condition:

Lack of an existing political consensus to get government(s) action to put a tax on crude oil (based on crude oil prices falling below a trend forecast)

Countermeasure:

Build a strong business coalition in favor of establishing a Green Energy Coalition, then use this business support, coupled with customer support, to build the political consensus needed.

Reason for selecting this approach:

Most advocates of action to address climate change impacts use a strategy of building public awareness and developing the political base to push through an action plan. Essentially, this approach uses customer demands to push political change, then use political change to dictate solutions and actions on climate change to business. The approach has several fatal problems.

First and foremost, most customers don't know what actions are most effective. Relying on customer demands to drive improved quality of products doesn't work well. Suppliers should know more about how to provide customers with a better quality product, than what their customers know. Suppliers should lead with innovative higher quality products not currently demanded by customers. Once customers see something works, they won't settle for less. To paraphrase the business quality expert, Dr. W. Edwards Deming, "Customers don't know what they need... But they are quick learners!"

Suppliers must lead the way with an effective plan to transition to green energy and address climate change and sustainability impacts.

Second, building a political base is important, but the critical task involves neutralizing the business world resistance to actions needed to improve the performance of economic sectors.

We should expect additional sabotaging actions from fossil fuel vested interests, and their political operatives selling free market capitalist dictates over a focus on customer needs. In order to neutralize these sabotaging attempts, we must focus on customers and economic sector performance.

Not only does a customer focused economy work better; it promotes free enterprise solutions better. Knowledgeable suppliers must lead and participate in evaluating customer needs, improvements, and market performance. As just discussed, trying to educate customers in the workings of the energy, vehicle, transportation, and agriculture markets (just to mention a few) and to reach a level of customer knowledge and skill necessary to evaluate decisions about actions in these markets is impossible.

But educating the experts on customer needs at key suppliers is doable. Most businesses in the economic sectors most impacted (by action on climate change), benefit from action, and lose business opportunities due to the current status quo of inaction. Hence, the key countermeasure to fossil fuel industry sabotaging actions, involves building a strong business coalition in support of a Green Energy Coalition, and not jumping into a political “knife fight” where everyone gets hurt.

The key players in a business coalition to support GECs, should be the key suppliers to green energy industry, including GE, Siemens, Mitsubishi, ABB, and others, in electrical equipment and green power, the auto manufacturers such as Ford, GM, Toyota, Honda, Tesla Motors, other European and Asian vehicle companies; large engineering design and construction companies; large agricultural industry suppliers like Monsanto, Cargill, and ADM; biofuel suppliers; and electric power companies, co-ops, and utilities.

In North America, the coalition should include a large section of companies in the Rust Belt, businesses in the Great Plains and Western states that will benefit from growth in green power and biofuels industries, and includes substantial businesses and employers all across America.

Why fight a David vs. Goliath fight, when advocates of action on climate change can use the principle of “overwhelming force”? Taking on a powerful group of entrenched fossil fuel companies (even with antiquated management teams) is much easier when you have an overpowering army of businesses that stand to benefit (from growth in new products and services that address a full suite of customer needs). The political change will follow from the realignment of business interests.

Then add to this army, an air force of free enterprise entrepreneurs eager to serve abused customers with better products, and a mass population of resistance fighters (customers) eager to ensure progress and access better quality products; then the combined forces can push the political change needed down the throats of even outdated and morally corrupt politicians.

If we recruit investors in the Green Energy Coalition first, and assemble the business coalition, then fighting the political change should be a walkover. The Coalition can begin investing in incentives for green vehicles, biofuels, green power, carbon sink enhancements, and form the group to fix problems in the natural gas market. The Coalition can establish a climate science group to study and quantify environmental impacts.

Then when the prices of fossil fuels begin falling as a result, the Coalition can make a much stronger case to governments to continue the programs that are clearly working; the Coalition can present their case for funding using a crude oil tax (tied to decline in oil prices), or use additional alternative funding. Customers at this point will be able to see the benefits, and customers would demand that government acts to continue and preserve access to the more affordable higher quality products and services.

Adding state and local governments, and publicly owned energy companies or cooperatives to the GEC and associate business coalition, strengthens the force in favor of acting on climate change even more. Currently, all governments in major vehicle markets in Europe, US, Japan, China, and India support green vehicles financially. Some states, like California, provide additional financial support for green vehicles. Other states have much to gain from increased profit margins on vehicle manufacturing or growth in the biofuels industry. These state governments would likely want to invest into an ownership stake in a GEC.

The actual action plan to establish a Green Energy Coalition is relatively straightforward:

- 1) Set up the Coalition corporate structure and leadership team.
- 2) Establish IP position by filing national phase applications to the current business methods application, and additional peripheral business method patent applications.
- 3) Recruit foundational investors (large companies anticipated to be key suppliers to green energy industry).
- 4) Recruit vehicle manufacturers and agricultural sector investors.
- 5) Recruit other investors including electricity suppliers, energy systems suppliers, agricultural and forestry sector suppliers, water resource companies, and large engineering/construction companies.
- 6) Anticipate sabotaging actions and limiting conditions => set up countermeasures to neutralize sabotage and remove roadblocks.
- 7) Go public with the Green Energy Coalition.
- 8) Select and invest in trial green energy projects and energy programs.
- 9) Recruit state/local government investors.
- 10) Recommend government policies.

- 11) Ramp green energy efforts by increasing investment levels.
- 12) Drive political change, and pass supporting legislation around the world.
- 13) Establish government oversight.
- 14) Win! ...Reach critical energy market shares, emission reduction targets, carbon sink capacities, and stall the rise in GHG atmospheric levels.